EMC SYNCPLICITY FILE SYNC AND SHARE SOLUTION

- Automated file synchronization
- Flexible, cloud-based administration
- Secure, on-premises storage

EMC Solutions

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Overview

Document purpose This document describes the reference architecture of the EMC® Syncplicity® file sync and share solution, which was tested and validated by EMC Global Solutions. It describes the architecture, key components, and main features and functionality of the solution.

Solution purpose The purpose of this solution is to provide enterprises with the ability to implement secure and scalable online file synchronization and sharing for both single-site and multisite deployments. This solution provides flexible, cloud-based file sharing technology with secure, on-premises storage for improved productivity and enhanced data security.

Business case Today's enterprise business users need to access and share data from any location, on any device, at any time, both within and outside the organization. While cloud-based online file sharing offers flexibility and mobility, many organizations have serious concerns about the reliability of the storage and security of the data that is placed in the cloud. These organizations require an enterprise-grade solution that provides users with the functionality and high performance they need while providing organizations with the security and controls required to ensure that the data is protected.

Technology solution The Syncplicity file sync and share solution combines the flexibility and usability of cloud-based file-sharing technology with a secure, on-premises, and scalable storage infrastructure provided by EMC Isilon®, EMC Atmos®, or EMC VNX® arrays. Syncplicity is a single-vendor, end-to-end file-sharing solution that simplifies deployment and offers a single point of contact for support. EMC has configured and validated this solution at three points of scale: 200, 600, and 5,000 users.

The solution offers the following business benefits:

- **Improved productivity**
  Users gain new levels of agility and productivity with the ability to easily access, share, and synchronize files with anyone, anytime, anywhere, and on any device.

- **Flexibility and ease of management**
  Enterprises retain complete control over data and storage resources. The solution combines the manageability, scalability, and resiliency of EMC storage with Syncplicity automated file synchronization and enterprise-grade administration features.

- **Reduced compliance risk and increased security and control**
  Enterprise information remains on EMC protected storage, subject to IT security governance and policy control. Files remain on premises or on authorized user devices governed by IT policies.
Key components

Introduction
This section briefly describes the following key components used in this solution:

- Client
- Cloud-based orchestration
- Compute nodes
- Atmos, Isilon, or VNX storage system

Hardware resources on 6 and Software resources on page 7 provide more information on the components that make up the solution.

Client
The client end-user device can be a mobile phone, tablet, laptop, or desktop with the Syncplicity client software installed. The client also can be a simple browser interface that can be used to access Syncplicity file sync and share.

Orchestration
The orchestration layer provides user management, group management, policy enforcement, and metadata management to provide seamless collaboration across the enterprise. Syncplicity orchestration is cloud-based, multitenant software as a service (SaaS) that frees IT from deployment and maintenance problems. Data stored in the orchestration layer is minimal, and file data does not flow through the orchestration layer at any time.

Compute
The file sync and share solution with on-premises storage uses two or more virtual machines or virtual appliances (storage connectors) that service the file-sharing requests. In this reference architecture, all compute application instances are placed behind a load balancer. The solution provides the ability to enable or disable encryption at the compute layer, depending on administrative preferences and the security structure.

Compute nodes are the interface between the orchestration layer and the on-premises storage systems. A one-to-one or many-to-one relationship exists between compute nodes and the NFS or object storage systems. All compute nodes are independent of one another and can be added and removed based on requirements.

Storage
The compute nodes use NFS or object storage for user and group files. This solution uses Isilon or VNX systems for NFS storage and Atmos systems for object storage.
Solution architecture

Overview

Figure 1 depicts the physical architecture of the solution.

Table 1 lists the hardware components for this solution.

Note: Components in the existing environment might satisfy some of these requirements.

Table 1. Solution hardware

<table>
<thead>
<tr>
<th>Hardware component</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage connector virtual machines</td>
<td>2 (minimum), hosted on VMware vSphere hypervisor (ESXi, for example) 5.0 or later; each with:</td>
</tr>
<tr>
<td></td>
<td>• 8 vCPU (Intel Xeon E5 Family processors, 2.20 GHz or higher)</td>
</tr>
<tr>
<td></td>
<td>• 8 GB RAM</td>
</tr>
<tr>
<td></td>
<td>• 50 GB HDD</td>
</tr>
<tr>
<td>Network switches</td>
<td>2 physical switches, each with:</td>
</tr>
<tr>
<td></td>
<td>• 10 GbE port per ESXi server</td>
</tr>
<tr>
<td></td>
<td>• 1 GbE port per compute node (for management)</td>
</tr>
<tr>
<td></td>
<td>• 10 GbE port per compute node (for production data)</td>
</tr>
<tr>
<td>EMC storage array (Isilon, Atmos, or VNX)</td>
<td>Storage deployment based on capacity and performance requirements</td>
</tr>
</tbody>
</table>
Hardware component | Configuration
---|---
Load balancers* | • Global load balancer per site (for multisite configurations)
  • Web load balancer with externally addressable Secure Socket Layer (SSL)-offloading balancer in front of all virtual machines, configured with a Certificate Authority signed, not self-signed, SSL certificate
  • Atmos only: Load balancer in front of each Atmos storage node
**Note:** Ensure high availability for all points of failure if required.

Web application firewall | Optional

* Alternatively, software load balancers can be used. Refer to the *EMC Syncplicity File Sync and Share Solution Design Guide* for detailed descriptions and illustrations of single-site and multisite configurations with load balancers.

**Software resources** Table 2 lists the software components for this solution.

**Note:** Components in the existing environment might satisfy some of these requirements.

### Table 2. Solution software

<table>
<thead>
<tr>
<th>Software component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware vSphere 5.5</td>
<td>Hypervisor hosting all virtual machines</td>
</tr>
<tr>
<td>VMware vCenter Server 5.5</td>
<td>Manager of vSphere environment</td>
</tr>
<tr>
<td>VMware vShield Manager Open Virtualization Appliance (OVA file)</td>
<td>Manager of the vShield security framework for virtual data centers and cloud environments</td>
</tr>
<tr>
<td>EMC PowerPath®/Virtual Edition</td>
<td>Multipathing software</td>
</tr>
<tr>
<td>Microsoft Windows Server 2008 R2</td>
<td>Recommended OS for vCenter host</td>
</tr>
<tr>
<td>Microsoft Windows 7 SP1</td>
<td>Desktop OS for clients</td>
</tr>
<tr>
<td>Syncplicity Storage Connector (OVA file)</td>
<td>Software that enables the compute node function that controls where files are stored</td>
</tr>
<tr>
<td>Atmos 2.1.4 or later (for Atmos implementations only)</td>
<td>Atmos client software</td>
</tr>
<tr>
<td>Syncplicity Client</td>
<td>Client software for file sync and share</td>
</tr>
<tr>
<td>Syncplicity Enterprise Edition account</td>
<td>License-based SaaS enterprise file sync and share account</td>
</tr>
</tbody>
</table>
This section summarizes considerations for compute node and storage sizing.

**Compute node sizing**

The number of compute node instances required depends on the customer profile. The two primary considerations are the maximum number of users supported per compute node and the maximum number of concurrent transactions supported. The current sizing ratio of total users per compute node is 1,000 to 1, with an expectation of 50 simultaneous transactions per node. The compute nodes should be deployed in pairs for high availability.

**Storage sizing**

As with compute node sizing, storage sizing depends on the customer profile. Influencing factors include the number of users, types of users based on their capacity requirements, and compute node requirements.

Table 3 shows an example of storage sizing for a 200-user environment.

**Table 3. Example of storage sizing for 200-user environment**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Calculation</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of users (clients)</td>
<td>200 clients</td>
<td>200 clients</td>
</tr>
<tr>
<td>Group1 (10 GB) active user data—standard service (75% of users)</td>
<td>150 x 10 GB</td>
<td>1.5 TB</td>
</tr>
<tr>
<td>Group2 (50 GB) active user data—premium service (25% of users)</td>
<td>50 x 50 GB</td>
<td>2.5 TB</td>
</tr>
<tr>
<td>Size of inactive user data</td>
<td>(Group 1 + Group 2) x 15% overhead for version and previously deleted files</td>
<td>0.6 TB</td>
</tr>
<tr>
<td>Storage for compute node virtual machine</td>
<td>2 x 50 GB VMDK space for virtual machine</td>
<td>100 GB</td>
</tr>
<tr>
<td>Back-end storage (Total usable content capacity)</td>
<td>Group 1 + Group 2 + size of inactive user data</td>
<td>4.6 TB (usable)</td>
</tr>
</tbody>
</table>
Table 4 shows a consolidated back-end storage requirement (based on the resource examples provided in Table 3) for the points of scale validated in this solution.

**Table 4. Example of storage requirements for 200, 600, and 5,000 users**

<table>
<thead>
<tr>
<th>User count</th>
<th>Required storage (usable)</th>
<th>Storage with 25% growth (usable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>5 TB (round of 4.6 TB)</td>
<td>6.25 TB</td>
</tr>
<tr>
<td>600</td>
<td>14 TB</td>
<td>17.5 TB</td>
</tr>
<tr>
<td>5,000</td>
<td>115 TB</td>
<td>143.75 TB</td>
</tr>
</tbody>
</table>

**Note:** Refer to the Design Guide for detailed information about sizing and best practices. Before implementing the Syncplicity on-premises solution, consult EMC about the appropriate capacity calculation of the back-end storage to best fit the customer profile.

The network infrastructure requires redundant network links for each vSphere host, the storage array, switch interconnect ports, and switch uplink ports. This configuration, which is required regardless of whether the network infrastructure for the solution already exists or is deployed with other solution components, provides both redundancy and additional network bandwidth.

**Atmos network configuration**

Figure 2 provides an example of a highly available network topology with Atmos storage.

![Network configuration diagram]

**Figure 2. Example of a highly available network design with Atmos storage**
Isilon network configuration

Figure 3 provides an example of a highly available network topology with Isilon storage.

![Isilon network configuration diagram]

Figure 3. Example of a highly available network design with Isilon storage

VNX network configuration

Figure 4 provides an example of a highly available network topology with VNX storage.

![VNX network configuration diagram]

Figure 4. Example of a highly available network design with VNX storage
### Solution features and functionality

**Overview**

This section briefly describes the key features and functionality of the Syncplicity file sync and share solution.

**Automated file synchronization**

The Syncplicity online file-sharing solution synchronizes file changes across all devices in real time so that documents are always protected and available both inside and outside the organization. Users do not need to drag and drop files to a special folder or check them in and out of a portal. Syncplicity backs up and instantly syncs every file change made with every device with shared access to the file.

**Administrative tools and security**

The Syncplicity solution includes a comprehensive set of security features and control at the user, device, folder, and file levels, and enables IT to maintain control of and visibility into large-scale file sharing. Administration, support, and reporting features enable administrators to deploy, support, and scale the Syncplicity solution.

Administration and security features include:

- Single sign-on with Microsoft Active Directory or any Security Assertion Markup Language (SAML)-based authentication system and Active Directory synchronization for user and group management
- Two-factor authentication
- AES 256-bit encryption
- Bulk account creation
- Remote wipe of devices, user accounts, and folders
- Extensive reporting including audit reports by user, device, folder, and file
- Dashboard view of storage use

**Compliance and policy controls**

Robust compliance and policy controls are integral to the Syncplicity online file-sharing solution. Control features include:

- Group-level control for access, sharing, and collaboration policies
- Policies that restrict or permit sharing by device, network, and IP address, among other criteria
- External sharing restrictions
- Secure Shared Link policies
- Mobile data plan policies
- Data retention policies
- File conflict policies
This Syncplicity solution provides high-efficiency data storage, through the use of Isilon, VNX (file or unified block and file), or Atmos storage systems, with the following benefits:

- Flexibility and control over the storage layer so organizations can meet or exceed requirements for corporate or industry compliance, or data residency.
- Access to excess storage capacity that is available across multiple storage arrays in the data center.
- Ability to retain complete control over your data. Files are never cached in or even pass through the Syncplicity service; instead, they move directly from storage to the users’ devices.
Syncplicity multisite use cases

Overview
This section provides examples of multisite Syncplicity deployments. Refer to the Design Guide for additional guidelines about multisite deployments.

Use case 1

Client locations/data centers: Outside of the U.S.

Customer requirements/data flow:
- Customer requires that the solution include a disaster recovery (DR) plan with an alternate site where users can regularly back up data.
- Customer can choose to have the infrastructure in place but not deployed, or customer can have the infrastructure deployed and running in a warm state, ready to be activated if the primary site goes down.

Configuration:
- Site 1 and site 2 (DR site) have the Syncplicity infrastructure (Storage Connector to back-end storage self-contained).
- All sites are integrated with the customer’s single Syncplicity account, which is an enterprise cloud-based file sync and share SaaS application.
- User groups are assigned to a specific StorageVault (with the choice of Atmos, Isilon, or VNX storage arrays) at site 1 by configuring a storage set in the Syncplicity account.
- Replication technologies specific to the EMC storage array are used to replicate data across site 1 and site 2.
- To switch to site 2, the customer updates StorageVault information with the Storage Connector servers (URLs) of site 2 or, if the Storage Connector servers are behind a load balancer (for example, https://syncplicity.company-name.com) in the Syncplicity account. The DR storage read/write is available.

Note: Consult your EMC sales representative for assistance with DR.

Use case 2

Client locations/data centers: U.S., Asia, and Europe

Customer requirements/data flow: Data must remain in the location in which it is generated.

Configuration:
- Each data center in the U.S., one in Asia, and one in Europe have the Syncplicity infrastructure (Storage Connector to back-end storage self-contained).
- All sites are integrated with the customer’s single Syncplicity account, which is an enterprise cloud-based file sync and share SaaS application.
• User groups are assigned to a specific StorageVault (with the choice of Atmos, Isilon, or VNX storage arrays), independent of the geographic location, by configuring a storage set in the Syncplicity account.

**Note:** Do not use the default storage set, which is applicable to all users in an account, when the data must stay within the geographic location.

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**Use case 3**

**Client locations/data centers:** U.S. and Asia

**Customer requirements/data flow:**

- Users in both locations are working collaboratively on a daily basis on a large design or production project, sharing CAD designs, reports, and analytics daily, or on a Hollywood animated film production. The files sizes are 100 MB, and even GB-size in some cases.

- Data must be synchronized across the geographic locations; that is, the users must be able to obtain updated files every day when they turn on their PCs and not wait on long downloads across geographies.

**Configuration:**

- Each data center in the U.S. and one in Asia must have the Syncplicity infrastructure (Storage Connector to back-end storage self-contained).

- All sites are integrated with the customer’s single Syncplicity account, which is an enterprise cloud-based file sync and share SaaS application.

- User groups are assigned to a specific StorageVault (Atmos storage array), independent of the geographic location, by configuring a storage set in the Syncplicity account.

- Atmos creates a replica of each object that was created by Syncplicity on site 1 (U.S.) and synchronizes with site 2 (Asia) according to a predefined policy during Atmos storage configuration.

- When a client requests data, the global traffic manager resolves the data from the closest data center, site 1 or site 2, regardless of the client’s location.
Conclusion

This reference architecture provides a blueprint of a validated solution for enterprise-grade file sync and sharing with on-premises storage enabled by Syncplicity tools and EMC storage platforms. The solution combines cloud-based file-sharing tools with high-performing, scalable on-premises storage that provides the security and controls required for data protection. EMC has configured and validated this solution at three points of scale: 200, 600, and 5,000 users.

This solution provides automated file synchronization, a comprehensive set of administration and security features with group-level controls, and high-efficiency on-premises data storage.

With this solution, users gain increased agility and productivity while the enterprise retains control over data and storage resources. Enterprise information remains on protected storage, subject to IT security governance and policy control. Files remain on premises or on authorized user devices governed by IT policies.
References

The following documents, located on EMC.com, provide additional and relevant information. Access to these documents depends on your login credentials. If you do not have access to a document, contact your EMC representative.

- *EMC Syncplicity File Sync and Share Solution Design Guide*
- *Secure, Enterprise File Sync and Share with EMC Syncplicity Utilizing EMC Isilon, EMC Atmos, and EMC VNX White Paper*
- *Secure Enterprise Mobility: EMC Syncplicity and EMC Atmos Cloud Storage Solution Overview*
- *EMC Syncplicity with EMC Isilon Solution Overview*
- *Secure, Flexible On-Premise Storage with EMC Syncplicity and EMC Isilon White Paper*